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TECHNICAL MEMORANDUM 2

ADDENDUM TO FINAL PHASE II RFI/RI WORK PLANS (ALLUVIAL AND BEDROCK)

CHEMICAL ANALYSIS PLAN

ROCKY FLATS PLANT

903 PAD, MOUND AND EAST TRENCHES AREA

(OPERABLE UNIT NO 2)

U S DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden Colorado

ENVIRONMENTAL RESTORATION PROGRAM

July 1991

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This document provides analysis and rationale for amending the analytical strategy for the RCRA Facility Investigation/CERCLA Remedial Investigation (RFI/RI) (Alluvial and Bedrock) at Operable Unit No 2 (OU2) The RFI/RI Work Plans stipulates that soils, sediments, ground water, and surface water be analyzed for all Contract Laboratory Program (CLP) Target Compound List (TCL) organic constituents The analytical program is conservative for various reasons discussed herein, however, considering that the RFI/RI for OU2 is in its second phase, it appears that the need for such a comprehensive analytical program should be reevaluated This document presents a historical review of how the analyte lists evolved as well as an analysis of available sampling results from OU2 as justification for eliminating certain analytical suites from the overall program The basis for developing a site-specific target analyte list is discussed in U S Environmental Protection Agency (EPA) guidance documents for conducting remedial investigations and feasibility studies (EPA, 1988) and for developing data quality objectives for remedial response activities (EPA, 1989) As discussed with EPA and the Colorado Department of Health (CDH) in a meeting on 17 May 1991, the approach is applicable to establishing the analytical strategy for the upcoming OU2 RFI/RI

BACKGROUND

Comprehensive site characterization began at OU2 in 1986, and a Phase I RI report for OU2 was submitted in December 1987 Site characterization for this previous RI was based on analysis of soils, sediments, ground water and surface water for the CLP Hazardous Substance List (HSL) compounds (Currently this list of analytes is known as the TCL, however, it should be noted that there are minor differences in the two lists) Phase II RFI/RI Work Plans for the alluvial and bedrock hydrogeologic systems have been prepared for OU2 which are designed to fill data gaps that were identified in the earlier phase of investigation

The OU2 RFI/RI Work Plans specify analysis of soils, sediments, ground water, and surface water for all TCL organic compounds Analysis for the full suite of TCL organics for ground water and surface water beyond the first round of samples would be dependent on the initial results The need for continued full suite analysis would be based on an assessment approach not unlike that presented in this document The TCL was chosen as the basis for characterizing this OU because it is used by EPA in characterizing uncontrolled hazardous waste sites where historical waste disposal practices are often unknown, and because of the associated high quality assurance/quality control procedures that are widely accepted by both federal and

state agencies Although chlorinated solvents (and radionuclides) are the principal contaminants at this OU, based on historical waste disposal records and previously collected data, a list of all chemicals disposed at this location is not known, which established the need for monitoring for a more comprehensive list of analytes

With respect to soils, the full suite of TCL organics was specified, because the upcoming phase of investigation is designed to provide a comprehensive characterization eliminating the need for subsequent phases of investigation More specifically, semivolatiles and pesticides/PCBs were to be analyzed at OU2 because previously collected data indicated the consistent occurrence of phthalate esters and the infrequent occurrence of other semivolatile compounds and PCBs Also, several proposed waste investigation boreholes will penetrate waste sources (Individual Hazardous Substance Sites [IHSSs]), where previous targeted soil sampling was outside the waste source boundaries Thus, the full suite of TCL organics is currently specified because of the uncertainty of the types of waste that were disposed at these OU2 IHSSs

Ground water and surface water are to be analyzed for the full suite of TCL organics because of the infrequent occurrence of semivolatiles or pesticides/PCBs as indicated by previously collected data, and the limited quantity of historical data for these classes of chemicals (one to two rounds) Sediments will also be analyzed for the full suite of TCL organics largely because of it's relevance to contaminant migration in surface water

APPROACH

The approach to defining a site-specific target analyte list consists of the following two steps

Step 1 Summarize Existing Analytical Data by Analytical Suite

In step 1 existing data are tabularized showing the total number of analyses for each chemical within an analytical suite, and the total number of detections of each chemical This is performed for each medium that was characterized Seven analytical suites within three major chemical groupings based on analytical protocol can be identified The analytical suites are as follows

Group A Compounds, TCL Volatiles

I Ketones and Aldehydes
II Monocyclic Aromatics
III Chlorinated Aliphatics

Group B Compounds, TCL Semivolatiles

IV Acid Extractables
V Base Neutral Extractables

Group C Compounds, Pesticides/PCBs

VI PCBs
VII Pesticides

This exercise yields one of three possible outcomes

1) **Case 1** Chemicals within one or more analytical suites in a specified media have not been detected at a given detection limit

2) **Case 2** One or more chemicals from an analytical suite have been detected in a specified media either inconsistently or at low concentrations

3) **Case 3** Consistent detections of one or more chemicals from an analytical suite in a specified media

Step 2 Evaluation of Results

Each of the cases identified above have implications with regard to the elimination of an analytical suite from the analytical program In Case 1, a strong case can be made to eliminate the analytical suite provided the historical data are of adequate quality or useability, and are representative of the site Data quality is assessed in accordance with the ER Program Quality Assurance Project Plan (QAPjP) and the General Radiochemistry and Analytical Services Protocol (GRAASP), and references therein Evaluation of representativeness must include spatial considerations For example, if the chemicals within one or more analytical suites were not detected at a specified sample location, it is necessary to be sure associated potential waste sources were investigated For Case 3, continued monitoring for the analytical suite(s) in order to better characterize the medium is justified, particularly if the chemicals are mobile and toxic Elimination of a suite of chemicals, where historical data fit Case 2, requires an assessment of data quality, spatial representativeness, temporal considerations (depending on the concentrations observed), chemical fate and transport, and human risks posed by the chemicals

Assessment of chemical fate and transport and human/environmental risks is one of determining whether the chemical is at a concentration in a specific medium that poses an unacceptable risk to humans or the environment through a likely exposure pathway, and whether the chemical can migrate to another medium at concentrations that also pose an unacceptable risk

Fate and Transport

Table 1 presents some of the relevant chemical/physical parameters that relate to the environmental fate and transport of representative chemicals from each of the analytical suites previously identified The general tendency for chemicals from each group to migrate from one environmental medium to another is discussed below This is summarized in Table 2

Group A Compounds, TCL Volatile Organic Compounds

Generally, TCL volatiles have computed mobility indices that suggest high mobility in the environment They are characterized by relatively high water solubility (greater that 100 mg/l) and volatility (vapor pressures generally much greater than 1 mm Hg and Henry's Law Constants greater than 0 1) Volatiles can be expected to migrate through soils, and to be transported by ground water and surface water as neutral solutes This is denoted by the saturated zone retardation factors (Rds) between 1 and 50 (Note chemical migration velocity = water migration velocity/Rd) The substantial vapor pressures and Henry's Law Constants suggest a tendency to volatilize from aqueous systems (including soil water) to the atmosphere

Group B and C Compounds, Semivolatiles and Pesticides/PCBs

In general, semivolatiles and pesticides/PCBs are considered to be slightly to very immobile (pesticides and PCBs are particularly immobile) Again this is denoted by the high saturated zone retardation factors Phenols are the most mobile of these compounds owing to their high water solubility Semivolatiles and pesticides/PCBs exhibit low to negligible volatility as indicated by the very low vapor pressures and Henry's Law Constants This suggests a low propensity for volatilization of these compounds to the atmosphere from soil and soil water

Toxicity

Without the benefit of a risk assessment, it is necessary to rely on published acceptable concentrations for chemicals to estimate the risk posed by the various chemicals in each of the media they are found Many of these published standards are considered Applicable or Relevant and Appropriate Requirements (ARARs) In this analysis Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) (an ARAR) and Action Levels under EPA's proposed RCRA Corrective Action Regulations (FR v 55, No 145, July 27, 1990, 40 CFR 264 521) are used to provide an estimate of concentrations of chemicals that are protective of human health The Action Levels are based on likely chemical exposure scenarios, a 10^{-6} incremental cancer risk (for carcinogens), or a no adverse health effect from a lifetime of exposure to a systemic contaminant (non carcinogen) MCLs and Action Levels used in this assessment are shown in Table 3

FINDINGS

Data Considered in This Evaluation

Data for OU2 contained in the Rocky Flats Environmental Data Base System (RFEDS) were used to perform this evaluation Data for the boreholes, ground-water wells, surface water stations, and sediment stations listed in Table 4 and shown in Figures 1 and 2 have been summarized in this document This includes all existing soil/sediment data and surface water and ground-water data collected through 1990 (and some more recent data)

Data Quality, Useability, and Representativeness

With the exception of the cases discussed below, soil and water quality data are either valid or acceptable with qualifications, based on limited data validation conducted in accordance with guidance provided in the QAPjP and GRAASP With respect to both soils and ground water, high concentrations of acetone, butanone, and methylene chloride in the laboratory blanks for the 1986 and 1987 investigations render it difficult to ascertain their presence in samples as an indication of site contamination Furthermore, volatile organic data for soils were rejected principally because of the high dilutions used (high detection limits) Since the 1986 and 1987 investigations, the sample collection methodology for volatiles in soils has been significantly improved to prevent volatile release during sample handling Therefore, these soil data have little or no useability In contrast, semivolatile and pesticide/PCB analyses of soils are valid or acceptable with qualifications based on the limited data validation

With respect to representativeness, the previous results are from boreholes, wells and surface water/sediment stations that span the entire OU However, boreholes at OU2 did not penetrate all the IHSSs Therefore, previous soil data cannot always be considered representative of buried wastes characteristics for all IHSSs Also, ground-water and surface water semivolatile and pesticide/PCB data are based on one or two rounds The impact of these observations are discussed further in the following section

Results

Table 5 provides a tabulation of the total number of analyses (based on summing the number of analyses performed for each chemical within an analytical suite) for each analytical suite and the number of occurrences for which a chemical was detected A detection is defined as all reported concentrations of a chemical, including those estimated below detection limits ("J" qualifier)

Ground Water and Surface Water

Volatiles

As shown in Tables 6, 7 and 8, volatiles are frequently detected and in significant concentrations The chlorinated aliphatics occur often and occasionally at high concentrations These compounds are known waste constituents and are relatively toxic Acetone, and to a lesser extent other ketones, also appear in the samples However, the occurrence of acetone and 2-butanone in a sample is often due to laboratory contamination, and there are no occurrences of acetone or 2-butanone above their action levels Concentrations of these ketones are generally two orders of magnitude less than the action level Based on the high health-based reference concentrations (action levels) of acetone and 2-butanone, it can be surmised that ketones are relatively non-toxic, and the less frequent occurrence of other ketones at low concentrations is of little concern Therefore, ketones could be eliminated from future analysis at OU2 However, there is little advantage in removing the ketones from the TCL volatile suite, and, therefore, ground-water and surface water samples will be analyzed for all TCL volatiles As a class, the volatiles represent Case 3

Semivolatiles (acid extractables)

As shown in Tables 9, 10 and 11, out of 69 analyses for acid extractables in ground and surface water, there have been a total of six detections of 2-methylphenol, benzoic acid, benzyl alcohol, pentachlorophenol, and phenol within this analytical suite Acid extractables were not detected in bedrock ground water The one detection of phenol is at a concentration of 13 $\mu g/\ell$ and occurred at station SW-27 (Table 12) The action level for phenol in water is 20,000 $\mu g/\ell$ Although phenol occurred in the sediments at SED030 (650J $\mu g/kg$), immediately upstream of SW-27, it did not occur in sediments in the associated sediment station (SED025), nor did it occur in surface water immediately upstream, or in soils or ground water anywhere within OU2 The isolated occurrences of phenol and the other acid extractable compounds at station SW-27 are at low concentrations, and were not detected in three other samplings of water at this station Of these acid extractables, only benzoic acid was detected in another medium (150J $\mu g/kg$ at SED011) This sediment station is in another drainage The only detection of an acid extractable compound in ground water is pentachlorophenol (4J $\mu g/\ell$) at well 39-86, approximately 3,000 feet northeast of the East Trenches Area Although pentachlorophenol was detected in the soils (at the bedrock contact and water table in boreholes BH4787 and BH5487, respectively), it was not detected in ground water immediately downgradient (well 41-86) Furthermore, the pentachlorophenol retardation factor (Table 1) together with the average seepage velocity of 82 ft/yr suggests the compound would have migrated less than a foot from this location during the past 30 years This suggests the datum for well 39-86 is spurious Regardless, the health-based reference concentration for pentachlorophenol is 1,000 $\mu g/\ell$ Based on these arguments and the fact that there is no

history of disposal of wastes containing acid extractable compounds, elimination of this analytical suite from future water monitoring at OU2 is justified

Semivolatiles (base neutral extractables)

As shown in Tables 13, 14 and 15, base/neutral extractables rarely occur in water at OU2 The most frequently occurring compounds are phthalate esters, particularly bis(2-ethylhexyl) phthalate occurring at estimated concentrations below the detection limit, and near the action level of 3 $\mu g/\ell$ However, this compound did occur at 220 $\mu g/\ell$ at SW-27, but must be considered an outlier relative to the other concentrations observed and because it was not detected at this station during two other samplings Phthalate esters are common laboratory contaminants, and bis(2-ethylhexyl)phthalate occurred often in the blanks for the samples where this compound was detected ("B" qualifier)

N-nitrosodiphenylamine occurred second most frequently, however, this compound is also a known laboratory contaminant that leaches from the gas chromatograph column (Note the compound occurred in the laboratory blank in more than half the samples) Furthermore, the concentrations of N-nitrosodiphenylamine are near the health-based reference concentration (7 $\mu g/\ell$), and generally are at estimated concentrations only

The remaining few base neutral extractable compounds that were detected are polynuclear aromatic hydrocarbons (PNAs) and all occurred at surface water station SW-101 These compounds were not present up or downgradient of this location, and are not considered site contaminants originating from historical waste disposal activities at OU2 (see discussion of semivolatiles in soils/sediments)

In general, none of the base neutral extractable compounds would be considered contaminants of concern from a human health risk assessment perspective owing to either their infrequent occurrence, low concentrations (estimated below detection limits), likelihood as a laboratory contaminant, or general absence in soils and sediments Further analysis for base neutral extractable compounds is not warranted during the Phase II RFI/RI

Pesticides/PCBs

As shown in Tables 16, 17 and 18, pesticide/PCB occurrences in ground water and surface water are rare The one occurrence of a pesticide was parathion in well 12-87 The concentration of parathion is well below its action level, 200 $\mu g/\ell$ AROCLOR-1254 is the only PCB that occurred in surface water The concentration was 0 15 $\mu g/\ell$, and was not detected in three other samplings at this location Because there is no record of disposal of pesticides or PCBs at OU2, and they occur infrequently and at low concentrations,

the elimination of pesticide/PCB analysis from future ground-water and surface water monitoring at OU2 is justified

Soils and Sediments

Volatiles

As shown in Tables 19 and 20, like ground water and surface water, chlorinated aliphatics occur in soils and sediments with high frequency and at high concentrations These compounds are known waste constituents that are both toxic and mobile in the environment These constituents should continue to be analyzed Although the monocyclic aromatics and the ketones appear to occur at concentrations far below their acceptable concentrations, the actual concentrations in soils within IHSSs is not known As previously discussed, this is because the sampling technique for volatiles in soils was inadequate Elimination of monocyclic aromatics and ketones cannot be justified because the soil/sediment RI data is of little useability as a result of the sample collection issue Therefore, the full suite of TCL volatiles will be analyzed for these media during the Phase II investigation

Semivolatiles (acid extractables)

Out of 243 analyses for acid extractables, there are only five detections of chemicals in this class for soils/sediments at OU2 (Tables 21, 22, and 23) Pentachlorophenol was detected in sediments at SED011, and in soils at borehole BH4787 and BH5487 This compound was not detected in surface water at or downgradient of SED011, and was detected at only a very low concentration in ground water at a downgradient well remote from boreholes BH4787 and BH5487 If this compound is truly a contaminant, it is at concentrations in soils/sediments far below the health-based reference concentration, and is not migrating into water at concentrations that would present an unacceptable human health risk The phenol detected at SED030 is far below the health-based reference concentration, and if it is a contaminant, it is also not migrating into surface water at levels that would pose an unacceptable human health risk The benzoic acid detected at SED011 was not detected in two other samplings at this location, nor was it detected in sediments or surface water downgradient of this section

Although it appears the detection of acid extractables at SED011 is of little importance to the characterization of OU2, the occurrence of base neutral extractables, pesticides and PCBs at this location suggest the station may be contaminated as a result of releases from OU2 sources, or other sources within the plant Therefore, the full suite of TCL organics will be run on a Phase II sample from this station and the nearest downgradient station (SED012) to better characterize sediments in this reach of South Walnut Creek Other sediment stations will be analyzed for TCL volatiles only

As shown in Table 24, several waste source boreholes have been proposed in IHSSs because previous drilling did not penetrate these waste sources Therefore, these IHSSs are not chemically characterized and these waste source borehole samples will be analyzed for all TCL organics However, other boreholes will only be analyzed for TCL volatiles

Semivolatiles (base neutral extractables)

There are frequent occurrences of base neutral extractables in soils/sediments at OU2 (Tables 25 and 26) However, phthalate esters represent the majority of these occurrences The presence of phthalate esters in samples is surmised to be due to field contamination from handling the samples with plastic gloves Regardless, the concentrations of the phthalate esters are far below the health-based reference concentration for bis(2-ethylhexyl) phthalate (assumed to be representative of the class) Also, phthalates are extremely immobile in the environment This is demonstrated by the site data that show the relatively infrequent occurrence of phthalates in water at OU2 N-nitrodiphenylamine is the next most frequently occurring base neutral extractable However, as discussed for surface water, this is considered a laboratory contaminant (occurs at estimated concentrations and is often present in the associated laboratory blanks), and also occurs at concentrations far below the health-based reference concentration With the exception of 2-chloroethyl vinyl ether and 4-nitroaniline which occur only once in greater than 200 total analyses (considered spurious), PNAs comprise the remainder of the occurrences of base neutral extractables in soils/sediments The occurrence of PNAs in soils is infrequent, and concentrations of PNAs are below the detection limit of 330 μg/kg Generally, the PNAs occur in the composite sample from the borehole that includes the surface It is not likely that PNAs are associated with past disposal of waste at OU2, and are more likely associated with PNA deposition in the environment from other sources, e g , burning of fossil fuels, fires, etc PNAs are also immobile in the environment which is supported by the OU 2 water quality data Therefore, only those boreholes at OU2 that will penetrate IHSSs for the first time, will be analyzed for base neutral extractables

All the PNAs observed in sediment samples are from SED011 As previously discussed under acid extractables, the samples from this station and SED012 will be analyzed for all TCL organics to better characterize sediments in this reach of South Walnut Creek

Pesticides/PCBs

Out of 249 analyses for pesticides/PCBs, there are only three occurrences of PCBs, and one occurrence of a pesticide in soils/sediments at OU2 (Tables 27 and 28) The concentrations of the PCBs in soils are below the action level of 90 μg/kg, however, AROCLOR-1254 occurred at 540 μg/kg at SED011 Also, 4,4'-DDT occurred at SED011 As previously discussed, SED011 and SED012 samples will be analyzed

for all TCL organics Otherwise, all other sediment stations will be analyzed for TCL volatiles only Only those boreholes at OU2 that will penetrate IHSSs for the first time will be analyzed for pesticides/PCBs

CONCLUSIONS

The conclusions presented above that delineate retaining or deleting analytical suites from future monitoring of environmental media at OU2 are summarized in Table 29 and schematically presented in Figures 2 and 3 Elimination of certain analytical suites from future monitoring/characterization of the various media at this OU is well justified and will not compromise achieving the objectives of the Phase II RFI/RI The future investigation activities will provide better characterization of the extent of contamination for those contaminants that are significant from a waste disposal and human health risk perspective Only waste characterization within IHSSs at OU2 that were not previously investigated will include the full suite of TCL organics because of the current lack of soil/waste characterization data for these sources If semivolatiles or pesticides/PCBs are detected at these IHSSs at significant levels, ground-water wells and surface water stations in the proximity of these IHSSs will be sampled and analyzed for these compounds at a later date, but prior to submittal of the Phase II RFI/RI report

Lastly, because CLP gas chromatograph/mass spectrometer (GC/MS) detection limits do not achieve "risk based" detection limits for some of the carcinogenic chlorinated solvents, EPA Method 502 2, which has detection limits as low as 0 5 $\mu g/\ell$, will be used for ground-water samples that are collected from wells near the edge of the plume (Table 30) This will allow achieving data quality objections for the RFI/RI All proposed 1991 wells (alluvial and bedrock) are being installed to better define the plume of organic contamination, and, therefore, samples from these wells will be analyzed for volatiles using this method Samples from existing wells and surface water stations remote from the IHSSs, as identified on Figures 2 and 3, will also be analyzed for volatiles using this method

TABLE 1

CHEMICAL/PHYSICAL PARAMETERS AFFECTING
ENVIRONMENTAL FATE AND TRANSPORT
(See Notes)

Group A Compounds, TCL Volatile Organics

I Ketones & Aldehydes

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Acetone	55 1	0 1	270.00	0 013	60000 0	-0 24	-0 43	1 0	8	Extremely Mobile

II Monocyclic Aromatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Benzene	78 1	0 9	76.00	0 182	1780 0	2 13	1 81	6 8	3	Very Mobile
Toluene	92 1	0 9	22 00	0 214	515 0	2 79	2 48	28 0	2	Very Mobile
Ethyl Benzene	106 2	0 9	7	0 266	152 0	3 34	3 04	100 0	-0	Slightly Mobile
Xylene	106 2	0 9	10	0 380	152 0	3 13	2.11	12 6	1	Very Mobile

III Chlorinated Aliphatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Carbon Tetrachloride	153 8	1 6	90 00	0 960	785 0	2 96	2 64	40 5	2	Very Mobile
Trichloroethene	131.4	1 5	60 00	0 390	1100 0	2.42	2 10	12 3	3	Very Mobile
Chloroform	119 4	1 5	160 00	0 130	8000 0	1 97	1 64	4 9	4	Very Mobile
1,1,2,2-Trichloroethane	167 9	1 6	5 00	0 016	2900 0	2 39	2 07	11 6	2	Very Mobile

Group B Compounds, Semi Volatile Organics

IV Acid Extractables (Phenolics)

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Phenol	94 1	1 1	0 20	1 2E-04	8200 0	1 46	1.15	2 3	2	Very Mobile
Pentachlorophenol	266 4	2 0	1 1E-04	1 1E-04	14 0	5 18	4.72	4771.3	-8	Immobile
2,4-Dinitrophenol	184 1	1 7	1 5E-05	2.7E-08	5600 0	1 54	1 22	2 5	-2	Slightly Immobile
2,4,6-Trichlorophenol	197 5	1 5	0.012	1 6E-04	800 0	3 61	3 30	181 0	-2	Slightly Immobile

V Base-Neutral Extractables

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Bis(2-ethylhexyl)phthalate	391.1	1 0	2.7E-07	4.4E-06	1 3	9 61	9.30	1.8E+08	-16	Very Immobile
Chrysene	228.2	1 3	1 0E-11	6 9E-08	0 0	5.61	5 30	1 8E+04	-19	Very Immobile
1,2,4-Trichlorobenzene	181.5	1 5	0.29	9.6E-02	30	4.28	3 96	8 3E+02	-3	Slightly Immobile
1,3-Dichlorobenzene	147.0	1 3	2 28	1.5E-01	123	4 28	3.96	8.3E+02	-2	Slightly Immobile
Naphthalene	128.2	1 0	0.087	1 9E-02	31.7	3 29	2.97	8 6E+01	-3	Slightly Immobile
Benzo(a)pyrene	252.0	1 4	5 6E-09	2.0E-05	3 8E-03	6.06	6.74	5 0E+05	-17	Very Immobile

Group C Compounds, PCB's and Pesticides

VI PCB's

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
PCB-1248	299 5	1 4	4 9E-04	1 5E-01	0 054	5.76	5.44	24931 0	-10	Immobile
PCB 1254	328 4	1 5	7 7E-05	4 6E-02	0 0	6 03	5 72	47233 7	-11	Very Immobile
PCB 1260	375 7	1 6	4 1E-05	2 8E-01	0 0	7 15	6 82	594625 1	-14	Very Immobile

VII Chlorinated Pesticides

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Dieldrin	381 0	1 8	1.8E-07	1 9E-05	0.2	3.54	3 23	153 8	-11	Very Immobile
DDT	375.7	1 6	1.9E-07	7.1E-04	5.5E-03	6.91	6 59	350141.6	-16	Very Immobile
Heptachlor	375.0	1 6	3.0E-04	3 4E-02	0 18	4 4	4 1	1081.0	-8	Immobile
Lindane	291 0	1.6	2 5E-05	2.5E-04	1.6	3 9	3.6	343 0	-8	Immobile
Chlordane	409 8	1 6	1.0E-05	4 0E-03	0 056	5 5	5 1	12601.0	-11	Very Immobile
Toxaphene	414 0	1 6	0 3	1 4E+01	0.5	3 3	3.0	87 8	-4	

TABLE 2

SUMMARY OF ENVIRONMENTAL
INTER-MEDIA MIGRATION
CHARACTERISTICS

Inter-Media Migration Characteristic	Aldehydes & Ketones	Monocyclic Aromatics	Chlorinated Aliphatics	Acid Extractables	Base-Neutral Extractables	PCB's	Pesticides
Soil to Groundwater	Yes	Yes	Yes	Yes	No	No	No
Soil or Soil Water to Air	No	Yes	Yes	No	No	No	No
Migration in Groundwater	Yes	Yes	Yes	Yes	No	No	No

TABLE 3

HEALTH-BASED REFERENCE CONTAMINANT CONCENTRATIONS

COMPOUND	MCL (µg/ℓ)	RCRA ACTION LEVEL	
		WATER (µg/ℓ)	SOIL (µg/kg)
Volatiles			
Benzene	5		
Ethylbenzene	700		8,000,000
Toluene	1,000		20,000,000
Xylene	10,000		200,000,000
Acetone		4,000	8,000,000
2-Butanone		2,000	4,000,000
Semivolatiles			
Bis(2-ethylhexyl)phthalate		3	50,000
Phenol		20,000	50,000,000
Pentachlorophenol		1,000	2,000,000
N-Nitrosodiphenylamine		7	100,000
1,2,4-Trichlorobenzene		700	2,000,000
1,4-Dichlorobenzene	7 5		
PCBs and Pesticides			
PCBs			90
Parathion		200	

TABLE 4

Existing
OU2 Boreholes, Ground-Water Wells,
Surface Water and Sediment Stations

Boreholes	Ground-Water Wells	Surface Water Stations	Sediment Stations
BH2287	3386	SW026	SD011
BH2387	3986	SW027	SD012
BH2487	4186	SW028	SD013
BH2587	4286	SW029	SD025
BH2687	4386	SW030	SD026
BH2787	1087	SW050	SD027
BH2887	1587	SW051	SD028
BH2987	1787	SW052	SD029
BH3087	1987	SW053	SD030
BH3187	2487	SW054	SD031
BH3287	2687	SW055	
BH3387	2787	SW057	
BH3487	3287	SW058	
BH3587	3387	SW062	
BH3687	3587	SW063	
BH3787	5087	SW064	
BH3887	0287	SW070	
BH3987	6386	SW077	
BH4087	6786	SW021	
BH4187	2987	SW022	
BH4287	4487	SW023	
BH4387	3586	SW059	
BH4487	3686	SW060	
BH4587	3786	SW061	
BH4687	6486	SW101	
BH4787	6586	SW065	
BH4887	6686	SW103	
BH4987	2187	SW024	
BH5087	0171	SW025	
BH5187	0271	SW102	
BH5287	0174	SW132	
BH5387	0374	SW133	
BH5487	6286		
BH5587	0386		
BH5687	0987BR		
BH5787	1187BR		
	1287BR		
	1487BR		
	2387BR		
	3687BR		
	3486		
	4086		
	1687BR		
	1887BR		
	2087BR		
	2287BR		
	2887BR		
	3087BR		
	3187BR		
	3487BR		
	4587BR		

TABLE 5

Summary of Detected Compounds for
Operable Unit No 2
Phase I RI and Subsequent Monitoring

Matrix Soil/Sediment

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	4 / 6497	2	No History of Release at the Site
Acid Extractables	5 / 3888	1	No History of Release at the Site
Base-Neutral Extractables	421 / 12131	2	Extremely Immobile in Soils
Volatile Organic Compounds	624 / 9213	3	Assumed to be Site-Related

Matrix Ground Water/Surface Water

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	2 / 2050	1	No History of Release at the Site
Acid Extractables	6 / 1104	1	No History of Release at the Site
Base-Neutral Extractables	56 / 3651	2	Extremely Immobile in Soils
Volatile Organic Compounds	1900 / 24,213	3	Assumed to be Site-Related

TABLE 6

OU2 SURFACE WATER VOA SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1 TRICHLOROETHANE	341	32	42	UG/L	11 6344
2	1,1,2,2-TETRACHLOROETHANE	341	2	3	UG/L	2 5000
3	1,1,2-TRICHLOROETHANE	341	1	2	UG/L	2 0000
4	1,1-DICHLOROETHANE	341	19	8	UG/L	3.1053
5	1,1-DICHLOROETHENE	329	19	140	UG/L	32 7368
6	1,2 DICHLOROETHANE	341	2	1	UG/L	1 0000
7	1,2-DICHLOROETHYLENE	312	39	320	UG/L	53 4872
8	1,2-DICHLOROPROPANE	341	0			
9	2-BUTANONE	343	9	20	UG/L	7 7778
10	2-HEXANONE	341	1	1	UG/L	1 0000
11	4-METHYL-2-PENTANONE	341	1	1	UG/L	1 0000
12	ACETONE	347	108	65	UG/L	7 5370
13	BENZENE	329	7	42	UG/L	12 0000
14	BROMODICHLOROMETHANE	341	7	2	UG/L	1 8571
15	BROMOFORM	341	0			
16	BROMOMETHANE	341	0			
17	CARBON DISULFIDE	341	4	3	UG/L	2 5000
18	CARBON TETRACHLORIDE	342	76	1005	UG/L	89 5053
19	CHLOROBENZENE	329	3	7	UG/L	3 6667
20	CHLOROETHANE	341	1	2	UG/L	2 0000
21	CHLOROFORM	343	80	84	UG/L	18 0963
22	CHLOROMETHANE	341	0			
23	DIBROMOCHLOROMETHANE	341	0			
24	ETHYLBENZENE	341	2	2	UG/L	1 5000
25	METHYLENE CHLORIDE	349	177	68	UG/L	5 8384
26	STYRENE	341	0			
27	TETRACHLOROETHENE	341	72	270	UG/L	32 2681
28	TOLUENE	329	18	18	UG/L	5 7778
29	TOTAL XYLENES	341	2	40	UG/L	36 5000
30	TRICHLOROETHENE	329	87	1600	UG/L	65 3598
31	VINYL ACETATE	341	4	2	UG/L	1 2500
32	VINYL CHLORIDE	341	22	16	UG/L	5 4091
33	cis 1,3-DICHLOROPROPENE	341	0			
34	trans-1,2-DICHLOROETHENE	33	10	20	UG/L	8 0000
35	trans-1,3 DICHLOROPROPENE	342	1	2	UG/L	2 0000
		11558	806			

TABLE 7

OU2 ALLUVIAL GROUND-WATER VOA SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	196	19	56	UG/L	14 21
2	1,1,2,2-TETRACHLOROETHANE	192	2	6	UG/L	4 50
3	1,1,2-TRICHLOROETHANE	195	1	4	UG/L	4 00
4	1,1-DICHLOROETHANE	192	11	62	UG/L	50 18
5	1,1-DICHLOROETHENE	195	24	48	UG/L	12 63
6	1,2-DICHLOROETHANE	195	2	320	UG/L	160 50
7	1,2-DICHLOROETHYLENE	187	28	1600	UG/L	122 82
8	1,2-DICHLOROPROPANE	192	0			
9	2-BUTANONE	192	12	800	UG/L	104 17
10	2 HEXANONE	192	0			
11	4 METHYL-2-PENTANONE	192	2	35	UG/L	18 00
12	ACETONE	192	37	410	UG/L	28 00
13	BENZENE	192	0			
14	BROMODICHLOROMETHANE	192	0			
15	BROMOFORM	192	0			
16	BROMOMETHANE	192	0			
17	CARBON DISULFIDE	192	2	3	UG/L	2 00
18	CARBON TETRACHLORIDE	195	62	7900	UG/L	1147 98
19	CHLOROBENZENE	192	0			
20	CHLOROETHANE	192	0			
21	CHLOROFORM	195	51	340	UG/L	34 84
22	CHLOROMETHANE	192	0			
23	DIBROMOCHLOROMETHANE	192	0			
24	ETHYLBENZENE	192	2	3	UG/L	3 00
25	METHYLENE CHLORIDE	192	57	260	UG/L	12 21
26	STYRENE	192	1	27	UG/L	27 00
27	TETRACHLOROETHENE	195	76	3200	UG/L	220 61
28	TOLUENE	192	13	20	UG/L	4 08
29	TOTAL XYLENES	192	5	23	UG/L	7 40
30	TRICHLOROETHENE	195	68	1400	UG/L	126 07
31	VINYL ACETATE	192	0			
32	VINYL CHLORIDE	192	14	930	UG/L	447 21
33	cis-1,3-DICHLOROPROPENE	192	0			
34	trans-1,2-DICHLOROETHENE	16	3	1070	UG/L	395 33
35	trans-1,3-DICHLOROPROPENE	192	0			
		6564	492			

TABLE 8

OU2 BEDROCK GROUND-WATER VOA SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	185	17	2400	UG/L	182 88
2	1,1,2,2-TETRACHLOROETHANE	177	2	4	UG/L	3 00
3	1,1,2 TRICHLOROETHANE	184	3	9	UG/L	6 67
4	1,1-DICHLOROETHANE	177	8	38	UG/L	15 38
5	1,1-DICHLOROETHENE	185	27	160	UG/L	21 63
6	1,2-DICHLOROETHANE	185	7	400	UG/L	84 57
7	1,2-DICHLOROETHYLENE	177	30	390	UG/L	62 87
8	1,2-DICHLOROPROPANE	177	1	3	UG/L	3 00
9	2-BUTANONE	177	13	1500	UG/L	182 31
10	2-HEXANONE	177	0			
11	4-METHYL-2 PENTANONE	177	5	10	UG/L	7 20
12	ACETONE	177	53	1600	UG/L	46 26
13	BENZENE	177	2	2	UG/L	2 00
14	BROMODICHLOROMETHANE	177	2	1	UG/L	1 00
15	BROMOFORM	177	0			
16	BROMOMETHANE	177	0			
17	CARBON DISULFIDE	177	9	12	UG/L	4 11
18	CARBON TETRACHLORIDE	185	75	4800	UG/L	724 07
19	CHLOROBENZENE	177	0			
20	CHLOROETHANE	177	0			
21	CHLOROFORM	185	75	930	UG/L	162 64
22	CHLOROMETHANE	177	0			
23	DIBROMOCHLOROMETHANE	177	0			
24	ETHYLBENZENE	177	2	75	UG/L	38 00
25	METHYLENE CHLORIDE	177	60	4100	UG/L	205 82
26	STYRENE	177	1	9	UG/L	9 00
27	TETRACHLOROETHENE	185	90	528000	UG/L	11674 77
28	TOLUENE	177	15	3100	UG/L	221 60
29	TOTAL XYLENES	177	3	1200	UG/L	485 67
30	TRICHLOROETHENE	185	96	57000	UG/L	6301 48
31	VINYL ACETATE	177	0			
32	VINYL CHLORIDE	177	1	1	UG/L	1 00
33	cis 1,3-DICHLOROPROPENE	177	0			
34	trans 1,2 DICHLOROETHENE	10	5	79	UG/L	33 80
35	trans-1,3-DICHLOROPROPENE	177	0			
		6091	602			

TABLE 9

OU2 SURFACE WATER ACID EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5 TRICHLOROPHENOL	58	0			
2	2,4,6 TRICHLOROPHENOL	58	0			
3	2,4 DICHLOROPHENOL	58	0			
4	2,4-DIMETHYLPHENOL	58	0			
5	2,4-DINITROPHENOL	58	0			
6	2 CHLOROPHENOL	58	0			
7	2 METHYLPHENOL	58	1	24	UG/L	24
8	2-NITROPHENOL	58	0			
9	4,6-DINITRO-2-METHYLPHENOL	58	0			
10	4-CHLORO-3-METHYLPHENOL	58	0			
11	4-METHYLPHENOL	58	0			
12	4-NITROPHENOL	58	0			
13	BENZOIC ACID	58	2	8	UG/L	8
14	BENZYL ALCOHOL	58	1	4	UG/L	4
15	PENTACHLOROPHENOL	58	0			
16	PHENOL	58	1	13	UG/L	13
		928	5			

TABLE 10

OU2 ALLUVIAL GROUND-WATER ACID EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	7	0			
2	2,4,6-TRICHLOROPHENOL	7	0			
3	2,4-DICHLOROPHENOL	7	0			
4	2,4-DIMETHYLPHENOL	7	0			
5	2,4-DINITROPHENOL	7	0			
6	2-CHLOROPHENOL	7	0			
7	2-METHYLPHENOL	7	0			
8	2-NITROPHENOL	7	0			
9	4,6-DINITRO-2-METHYLPHENOL	7	0			
10	4-CHLORO-3-METHYLPHENOL	7	0			
11	4-METHYLPHENOL	7	0			
12	4-NITROPHENOL	7	0			
13	BENZOIC ACID	7	0			
14	BENZYL ALCOHOL	7	0			
15	PENTACHLOROPHENOL	7	1	4	UG/L	4
16	PHENOL	7	0			
		112	1			

TABLE 11

OU2 BEDROCK GROUND-WATER ACID EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	4	0			
2	2,4,6-TRICHLOROPHENOL	4	0			
3	2,4-DICHLOROPHENOL	4	0			
4	2,4 DIMETHYLPHENOL	4	0			
5	2,4-DINITROPHENOL	4	0			
6	2 CHLOROPHENOL	4	0			
7	2 METHYLPHENOL	4	0			
8	2-NITROPHENOL	4	0			
9	4,6-DINITRO 2-METHYLPHENOL	4	0			
10	4-CHLORO-3-METHYLPHENOL	4	0			
11	4-METHYLPHENOL	4	0			
12	4-NITROPHENOL	4	0			
13	BENZOIC ACID	4	0			
14	BENZYL ALCOHOL	4	0			
15	PENTACHLOROPHENOL	4	0			
16	PHENOL	4	0			
		64	0			

TABLE 12

OU2 SURFACE WATER ACID EXTRACTABLE SUMMARY

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
SW027	SW27088600	2-METHYLPHENOL	24	UG/L		10	N	
SW027	SW27088600	BENZOIC ACID	8	UG/L	J	50	N	
SW064	SW00433WC	BENZOIC ACID	8	UG/L	J	50		23-OCT 90
SW064	SW00433WC	BENZYL ALCOHOL	4	UG/L	J	10		23-OCT 90
SW027	SW27088600	PHENOL	13	UG/L		10	N	

TABLE 13

OU2 SURFACE WATER BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	58	0			
2	1,2-DICHLOROBENZENE	58	0			
3	1,2 DIMETHYLBENZENE	37	0			
4	1,3-DICHLOROBENZENE	58	0			
5	1,4-DICHLOROBENZENE	58	0			
6	2,4-DINITROTOLUENE	58	0			
7	2,6-DINITROTOLUENE	58	0			
8	2-CHLOROETHYL VINYL ETHER	91	0			
9	2-CHLORONAPHTHALENE	58	0			
10	2-METHYLNAPHTHALENE	58	0			
11	2-NITROANILINE	58	0			
12	3,3'-DICHLOROBENZIDINE	58	0			
13	3-NITROANILINE	58	0			
14	4-BROMOPHENYL PHENYL ETHER	58	0			
15	4-CHLOROANILINE	58	0			
16	4-CHLOROPHENYL PHENYL ETHER	58	0			
17	4 NITROANILINE	58	0			
18	ACENAPHTHENE	58	0			
19	ACENAPHTHYLENE	58	0			
20	ANTHRACENE	58	1	2	UG/L	2 0000
21	BENZO(a)ANTHRACENE	58	1	1	UG/L	1 0000
22	BENZO(a)PYRENE	58	0			
23	BENZO(b)FLUORANTHENE	58	0			
24	BENZO(ghi)PERYLENE	58	0			
25	BENZO(k)FLUORANTHENE	58	0			
26	BIS(2-CHLOROETHOXY)METHANE	58	0			
27	BIS(2-CHLOROETHYL)ETHER	58	0			
28	BIS(2-CHLOROISOPROPYL)ETHER	58	0			
29	BIS(2-ETHYLHEXYL)PHTHALATE	58	17	220	UG/L	15 0000
30	BUTYL BENZYL PHTHALATE	58	1	1	UG/L	1 0000
31	CHRYSENE	58	1	1	UG/L	1 0000
32	DI-n-BUTYL PHTHALATE	58	5	2	UG/L	1 4000
33	DI-n-OCTYL PHTHALATE	58	0			
34	DIBENZO(a,h)ANTHRACENE	58	0			
35	DIBENZOFURAN	58	0			
36	DIETHYL PHTHALATE	58	0			
37	DIMETHYL PHTHALATE	58	0			
38	FLUORANTHENE	58	1	2	UG/L	2 0000
39	FLUORENE	58	0			
40	HEXACHLOROBENZENE	58	0			
41	HEXACHLOROBUTADIENE	58	0			
42	HEXACHLOROCYCLOPENTADIENE	58	0			
43	HEXACHLOROETHANE	58	0			
44	INDENO(1,2,3-cd)PYRENE	58	0			
45	ISOPHORONE	58	0			
46	N-NITROSO-DI n-PROPYLAMINE	58	0			
47	N-NITROSODIPHENYLAMINE	58	7	16	UG/L	7 8571
48	NAPHTHALENE	58	0			
49	NITROBENZENE	58	0			
50	PHENANTHRENE	58	0			
51	PYRENE	58	1	2	UG/L	2 0000
		2970	35			

TABLE 14

OU2 ALLUVIAL GROUND-WATER BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	7	0			
2	1,2-DICHLOROBENZENE	7	0			
3	1,3-DICHLOROBENZENE	7	0			
4	1,4-DICHLOROBENZENE	7	0			
5	2,4-DINITROTOLUENE	7	0			
6	2,6-DINITROTOLUENE	7	0			
7	2-CHLOROETHYL VINYL ETHER	87	0			
8	2-CHLORONAPHTHALENE	7	0			
9	2-METHYLNAPHTHALENE	7	0			
10	2-NITROANILINE	7	0			
11	3,3'-DICHLOROBENZIDINE	7	0			
12	3 NITROANILINE	7	0			
13	4-BROMOPHENYL PHENYL ETHER	7	0			
14	4-CHLOROANILINE	7	0			
15	4-CHLOROPHENYL PHENYL ETHER	7	0			
16	4-NITROANILINE	7	0			
17	ACENAPHTHENE	7	0			
18	ACENAPHTHYLENE	7	0			
19	ANTHRACENE	7	0			
20	BENZO(a)ANTHRACENE	7	0			
21	BENZO(a)PYRENE	7	0			
22	BENZO(b)FLUORANTHENE	7	0			
23	BENZO(ghi)PERYLENE	7	0			
24	BENZO(k)FLUORANTHENE	7	0			
25	BIS(2-CHLOROETHOXY)METHANE	7	0			
26	BIS(2-CHLOROETHYL)ETHER	7	0			
27	BIS(2-CHLOROISOPROPYL)ETHER	7	0			
28	BIS(2-ETHYLHEXYL)PHTHALATE	7	4	4	UG/L	2 75
29	BUTYL BENZYL PHTHALATE	7	0			
30	CHRYSENE	7	0			
31	DI-n-BUTYL PHTHALATE	7	5	21	UG/L	6 20
32	DI n-OCTYL PHTHALATE	7	0			
33	DIBENZO(a,h)ANTHRACENE	7	0			
34	DIBENZOFURAN	7	0			
35	DIETHYL PHTHALATE	7	0			
36	DIMETHYL PHTHALATE	7	0			
37	FLUORANTHENE	7	0			
38	FLUORENE	7	0			
39	HEXACHLOROBENZENE	7	0			
40	HEXACHLOROBUTADIENE	7	0			
41	HEXACHLOROCYCLOPENTADIENE	7	0			
42	HEXACHLOROETHANE	7	0			
43	INDENO(1,2,3-cd)PYRENE	7	0			
44	ISOPHORONE	7	0			
45	N-NITROSO-DI n PROPYLAMINE	7	0			
46	N NITROSODIPHENYLAMINE	7	4	17	UG/L	10 25
47	NAPHTHALENE	7	0			
48	NITROBENZENE	7	0			
49	PHENANTHRENE	7	0			
50	PYRENE	7	0			
		430	13			

TABLE 15

OU2 BEDROCK GROUND-WATER BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	4	0			
2	1,2-DICHLOROBENZENE	4	0			
3	1,2 DIMETHYLBENZENE	2	0			
4	1,3-DICHLOROBENZENE	4	0			
5	1,4-DICHLOROBENZENE	4	0			
6	2,4 DINITROTOLUENE	4	0			
7	2,6-DINITROTOLUENE	4	0			
8	2-CHLOROETHYL VINYL ETHER	53	0			
9	2-CHLORONAPHTHALENE	4	0			
10	2-METHYLNAPHTHALENE	4	0			
11	2-NITROANILINE	4	0			
12	3,3' DICHLOROBENZIDINE	4	0			
13	3-NITROANILINE	4	0			
14	4-BROMOPHENYL PHENYL ETHER	4	0			
15	4-CHLOROANILINE	4	0			
16	4-CHLOROPHENYL PHENYL ETHER	4	0			
17	4-NITROANILINE	4	0			
18	ACENAPHTHENE	4	0			
19	ACENAPHTHYLENE	4	0			
20	ANTHRACENE	4	0			
21	BENZO(a)ANTHRACENE	4	0			
22	BENZO(a)PYRENE	4	0			
23	BENZO(b)FLUORANTHENE	4	0			
24	BENZO(ghi)PERYLENE	4	0			
25	BENZO(k)FLUORANTHENE	4	0			
26	BIS(2-CHLOROETHOXY)METHANE	4	0			
27	BIS(2-CHLOROETHYL)ETHER	4	0			
28	BIS(2-CHLOROISOPROPYL)ETHER	4	0			
29	BIS(2-(ETHYLHEXYL)PHTHALATE	4	0			
30	BUTYL BENZYL PHTHALATE	4	0			
31	CHRYSENE	4	0			
32	DI-n-BUTYL PHTHALATE	4	2	4	UG/L	
33	DI-n-OCTYL PHTHALATE	4	0			
34	DIBENZO(a,h)ANTHRACENE	4	0			
35	DIBENZOFURAN	4	0			
36	DIETHYL PHTHALATE	4	0			
37	DIMETHYL PHTHALATE	4	0			
38	FLUORANTHENE	4	0			
39	FLUORENE	4	0			
40	HEXACHLOROBENZENE	4	0			
41	HEXACHLOROBUTADIENE	4	0			
42	HEXACHLOROCYCLOPENTADIENE	4	0			
43	HEXACHLOROETHANE	4	0			
44	INDENO(1,2,3-cd)PYRENE	4	0			
45	ISOPHORONE	4	0			
46	N-NITROSO-DI-n-PROPYLAMINE	4	0			
47	N NITROSODIPHENYLAMINE	4	4	19	UG/L	
48	NAPHTHALENE	4	0			
49	NITROBENZENE	4	0			
50	PHENANTHRENE	4	0			
51	PYRENE	4	0			
		251	8			

TABLE 16

OU2 SURFACE WATER PESTICIDE/PCB SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	59	0			
2	4,4'-DDE	59	0			
3	4,4'-DDT	59	0			
4	ALDRIN	59	0			
5	AROCLOR-1016	59	0			
6	AROCLOR-1221	59	0			
7	AROCLOR-1232	59	0			
8	AROCLOR-1242	59	0			
9	AROCLOR-1248	59	0			
10	AROCLOR-1254	59	1	0 15	UG/L	0 15
11	AROCLOR-1260	59	0			
12	CHLORDANE	5	0			
13	DIELDRIN	59	0			
14	ENDOSULFAN I	59	0			
15	ENDOSULFAN II	59	0			
16	ENDOSULFAN SULFATE	59	0			
17	ENDRIN	59	0			
18	ENDRIN KETONE	59	0			
19	HEPTACHLOR	59	0			
20	HEPTACHLOR EPOXIDE	59	0			
21	HEXAVALENT CHROMIUM	22	0			
22	METHOXYCHLOR	59	0			
23	PARATHION, ETHYL	9	0			
24	TOXAPHENE	59	0			
25	alpha-BHC	59	0			
26	alpha-CHLORDANE	54	0			
27	beta-BHC	59	0			
28	delta-BHC	59	0			
29	gamma-BHC (LINDANE)	59	0			
30	gamma-CHLORDANE	54	0			
		1619	1			

TABLE 17

OU2 ALLUVIAL GROUND-WATER PESTICIDE/PCB SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4' DDD	9	0			
2	4,4'-DDE	9	0			
3	4,4' DDT	9	0			
4	ALDRIN	9	0			
5	AROCLOR-1016	9	0			
6	AROCLOR 1221	9	0			
7	AROCLOR-1232	9	0			
8	AROCLOR-1242	9	0			
9	AROCLOR-1248	9	0			
10	AROCLOR-1254	9	0			
11	AROCLOR-1260	9	0			
12	CHLORDANE	9	0			
13	DIELDRIN	9	0			
14	ENDOSULFAN I	9	0			
15	ENDOSULFAN II	9	0			
16	ENDOSULFAN SULFATE	9	0			
17	ENDRIN	9	0			
18	ENDRIN KETONE	9	0			
19	HEPTACHLOR	9	0			
20	HEPTACHLOR EPOXIDE	9	0			
21	HEXAVALENT CHROMIUM	7	0			
22	METHOXYCHLOR	9	0			
23	PARATHION, ETHYL	12	0			
24	TOXAPHENE	9	0			
25	alpha-BHC	9	0			
26	beta-BHC	9	0			
27	delta-BHC	9	0			
28	gamma BHC (LINDANE)	9	0			
		253	0			

TABLE 18

OU2 BEDROCK GROUND WATER PESTICIDE/PCB SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4' DDD	5	0			
2	4,4'-DDE	5	0			
3	4,4'-DDT	5	0			
4	ALDRIN	5	0			
5	AROCLOR-1016	5	0			
6	AROCLOR-1221	5	0			
7	AROCLOR-1232	5	0			
8	AROCLOR 1242	5	0			
9	AROCLOR 1248	5	0			
10	AROCLOR-1254	5	0			
11	AROCLOR-1260	5	0			
12	CHLORDANE	5	0			
13	DIELDRIN	5	0			
14	ENDOSULFAN I	5	0			
15	ENDOSULFAN II	5	0			
16	ENDOSULFAN SULFATE	5	0			
17	ENDRIN	5	0			
18	ENDRIN KETONE	5	0			
19	HEPTACHLOR	5	0			
20	HEPTACHLOR EPOXIDE	5	0			
21	HEXAVALENT CHROMIUM	5	0			
22	METHOXYCHLOR	5	0			
23	PARATHION, ETHYL	43	1	0 08	MG/L	0 08
24	TOXAPHENE	5	0			
25	alpha-BHC	5	0			
26	beta-BHC	5	0			
27	delta-BHC	5	0			
28	gamma BHC (LINDANE)	5	0			
		178	1			

TABLE 19

OU2 SOIL VOA SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1 TRICHLOROETHANE	229	22	190	UG/KG	66 23
2	1,1,2,2 TETRACHLOROETHANE	229	0			
3	1,1,2-TRICHLOROETHANE	229	3	27	UG/KG	13 67
4	1,1-DICHLOROETHANE	229	0			
5	1,1-DICHLOROETHENE	229	1	8	UG/KG	8 00
6	1,2 DICHLOROETHANE	228	60	120	UG/KG	25 90
7	1,2-DICHLOROPROPANE	229	0			
8	2-BUTANONE	229	30	210	UG/KG	79 97
9	2-HEXANONE	229	0			
10	4-METHYL-2-PENTANONE	229	1	120	UG/KG	120 00
11	ACETONE	229	208	2400	UG/KG	269 37
12	BENZENE	229	1	12	UG/KG	12 00
13	BROMODICHLOROMETHANE	229	0			
14	BROMOFORM	229	0			
15	BROMOMETHANE	229	1	6	UG/KG	6 00
16	CARBON DISULFIDE	229	2	140	UG/KG	99 00
17	CARBON TETRACHLORIDE	229	3	100	UG/KG	59 67
18	CHLOROBENZENE	229	0			
19	CHLOROETHANE	229	2	50	UG/KG	28 50
20	CHLOROFORM	229	6	130	UG/KG	28 83
21	CHLOROMETHANE	229	0			
22	DIBROMOCHLOROMETHANE	229	0			
23	ETHYLBENZENE	229	3	780	UG/KG	360 33
24	METHYLENE CHLORIDE	229	136	210	UG/KG	14 69
25	STYRENE	229	1	17	UG/KG	17 00
26	TETRACHLOROETHENE	229	17	10000	UG/KG	982 35
27	TOLUENE	229	14	640	UG/KG	100 21
28	TOTAL XYLENES	229	5	3300	UG/KG	771 60
29	TRICHLOROETHENE	229	21	16000	UG/KG	1749 38
30	VINYL ACETATE	229	0			
31	VINYL CHLORIDE	229	0			
32	cis-1,3-DICHLOROPROPENE	229	2	6	UG/KG	6 00
33	trans-1,2 DICHLOROETHENE	229	2	10	UG/KG	9 00
34	trans 1,3 DICHLOROPROPENE	229	0			
		7785	541			

TABLE 20

OU2 SEDIMENT VOA SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1 TRICHLOROETHANE	42	0			
2	1,1,2,2-TETRACHLOROETHANE	42	0			
3	1,1,2-TRICHLOROETHANE	42	0			
4	1,1 DICHLOROETHANE	42	0			
5	1,1-DICHLOROETHENE	42	1	5	UG/KG	5 0000
6	1,2-DICHLOROETHANE	42	0			
7	1,2-DICHLOROETHYLENE	35	0			
8	1,2-DICHLOROPROPANE	42	0			
9	2-BUTANONE	42	3	100	UG/KG	42 6667
10	2-HEXANONE	42	0			
11	4-METHYL 2 PENTANONE	42	0			
12	ACETONE	42	25	480	UG/KG	70 0000
13	BENZENE	42	1	3	UG/KG	3 0000
14	BROMODICHLOROMETHANE	42	0			
15	BROMOFORM	42	0			
16	BROMOMETHANE	42	0			
17	CARBON DISULFIDE	42	1	6	UG/KG	6 0000
18	CARBON TETRACHLORIDE	42	0			
19	CHLOROBENZENE	42	1	4	UG/KG	4 0000
20	CHLOROETHANE	42	0			
21	CHLOROFORM	42	1	18	UG/KG	18 0000
22	CHLOROMETHANE	42	3	60	UG/KG	46 3333
23	DIBROMOCHLOROMETHANE	42	0			
24	ETHYLBENZENE	42	2	4	UG/KG	2 5000
25	METHYLENE CHLORIDE	42	28	54	UG/KG	12 5000
26	STYRENE	42	0			
27	TETRACHLOROETHENE	42	0			
28	TOLUENE	42	11	59	UG/KG	7 6364
29	TOTAL XYLENES	42	1	7	UG/KG	7 0000
30	TRICHLOROETHENE	42	5	8	UG/KG	5 4000
31	VINYL ACETATE	42	0			
32	VINYL CHLORIDE	42	0			
33	cis-1,3-DICHLOROPROPENE	42	0			
34	trans-1,2-DICHLOROETHENE	7	0			
35	trans-1,3 DICHLOROPROPENE	42	0			
		1428	83			

TABLE 21

OU2 SOIL ACID EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	224	0			
2	2,4,6-TRICHLOROPHENOL	224	0			
3	2,4-DICHLOROPHENOL	224	0			
4	2,4-DIMETHYLPHENOL	224	0			
5	2,4-DINITROPHENOL	224	0			
6	2-CHLOROPHENOL	224	0			
7	2-METHYLPHENOL	224	0			
8	2-NITROPHENOL	224	0			
9	4,6-DINITRO-2-METHYLPHENOL	224	0			
10	4-CHLORO-3-METHYLPHENOL	224	0			
11	4-METHYLPHENOL	224	0			
12	4-NITROPHENOL	224	0			
13	BENZOIC ACID	224	0			
14	BENZYL ALCOHOL	224	0			
15	PENTACHLOROPHENOL	224	2	95	UG/KG	68
16	PHENOL	224	0			
		3584	2			

TABLE 22

OU2 SEDIMENT ACID EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	19	0			
2	2,4,6-TRICHLOROPHENOL	19	0			
3	2,4-DICHLOROPHENOL	19	0			
4	2,4-DIMETHYLPHENOL	19	0			
5	2,4-DINITROPHENOL	19	0			
6	2-CHLOROPHENOL	19	0			
7	2-METHYLPHENOL	19	0			
8	2-NITROPHENOL	19	0			
9	4,6-DINITRO-2-METHYLPHENOL	19	0			
10	4-CHLORO-3-METHYLPHENOL	19	0			
11	4-METHYLPHENOL	19	0			
12	4-NITROPHENOL	19	0			
13	BENZOIC ACID	19	1	150	UG/KG	150
14	BENZYL ALCOHOL	19	0			
15	PENTACHLOROPHENOL	19	1	270	UG/KG	270
16	PHENOL	19	1	650	UG/KG	650
		304	3			

TABLE 23

OU2 SOIL AND SEDIMENT ACID EXTRACTABLE SUMMARY

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
BH4787	BH478726CT	PENTACHLOROPHENOL	95 00	UG/KG	J		N	15-SEP-87
BH5487	BH548702WT	PENTACHLOROPHENOL	41 00	UG/KG	J		N	15 SEP 87
SED011	SS80001WC	BENZOIC ACID	150	UG/KG	J	1600		05-SEP-90
SED011	SS80001WC	PENTACHLOROPHENOL	270	UG/KG	J	1600		05-SEP-90
SED030	SS00121WC	PHENOL	650	UG/KG	J	330		22-AUG-90

TABLE 24

SOURCE CHARACTERIZATION BOREHOLES
FOR IHSSs NOT PREVIOUSLY DRILLED

IHSS	Boreholes
903 Drum Storage Site (IHSS Ref No 112	BH0191 through BH1391
Gas Detoxification Site (IHSS Ref No 183)	BH4691
Pallet Burn Site (IHSS Ref No 154)	BH2891
Trenches T-3 through T-11 (IHSS Ref Nos 110, 111 1 through 111 8)	BH2991 through BH4191
East Spray Field (IHSS Ref Nos 216 2 and 216 3)	BH4291 through BH4591

TABLE 25

OU2 SOIL BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4 TRICHLOROBENZENE	224	0			
2	1,2-DICHLOROBENZENE	224	0			
3	1,3-DICHLOROBENZENE	224	0			
4	1,4-DICHLOROBENZENE	224	0			
5	2,4-DINITROTOLUENE	224	0			
6	2,6-DINITROTOLUENE	224	0			
7	2-CHLOROETHYL VINYL ETHER	229	1	31	UG/KG	31 00
8	2-CHLORONAPHTHALENE	224	0			
9	2-METHYLNAPHTHALENE	224	0			
10	2-NITROANILINE	224	0			
11	3,3'-DICHLOROBENZIDINE	224	0			
12	3-NITROANILINE	224	0			
13	4-BROMOPHENYL PHENYL ETHER	224	0			
14	4-CHLOROANILINE	224	0			
15	4-CHLOROPHENYL PHENYL ETHER	224	0			
16	4-NITROANILINE	224	1	1600	UG/KG	1600 00
17	ACENAPHTHENE	224	0			
18	ACENAPHTHYLENE	224	0			
19	ANTHRACENE	224	0			
20	BENZO(a)ANTHRACENE	224	0			
21	BENZO(a)PYRENE	224	0			
22	BENZO(b)FLUORANTHENE	224	0			
23	BENZO(ghi)PERYLENE	224	0			
24	BENZO(k)FLUORANTHENE	224	0			
25	BIS(2-CHLOROETHOXY)METHANE	224	0			
26	BIS(2 CHLOROETHYL)ETHER	224	0			
27	BIS(2-CHLOROISOPROPYL)ETHER	224	0			
28	BIS(2-ETHYLHEXYL)PHTHALATE	224	220	18000	UG/KG	927 50
29	BUTYL BENZYL PHTHALATE	224	1	69	UG/KG	69 00
30	CHRYSENE	224	0			
31	DI-n-BUTYL PHTHALATE	224	98	3400	UG/KG	107 62
32	DI n-OCTYL PHTHALATE	224	4	260	UG/KG	137 75
33	DIBENZO(a,h)ANTHRACENE	224	0			
34	DIBENZOFURAN	224	0			
35	DIETHYL PHTHALATE	224	0			
36	DIMETHYL PHTHALATE	224	0			
37	FLUORANTHENE	224	2	110	UG/KG	73 50
38	FLUORENE	224	0			
39	HEXACHLOROBENZENE	224	0			
40	HEXACHLOROBUTADIENE	224	0			
41	HEXACHLOROCYCLOPENTADIENE	224	0			
42	HEXACHLOROETHANE	224	0			
43	INDENO(1,2,3-cd)PYRENE	224	0			
44	ISOPHORONE	224	0			
45	N-NITROSO-DI-n-PROPYLAMINE	224	0			
46	N-NITROSODIPHENYLAMINE	224	60	370	UG/KG	72 22
47	NAPHTHALENE	224	0			
48	NITROBENZENE	224	0			
49	PHENANTHRENE	224	0			
50	PYRENE	224	1	39	UG/KG	39 00
		11205	388			

TABLE 26

OU2 SEDIMENT BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	19	0			
2	1,2-DICHLOROBENZENE	19	0			
3	1,3-DICHLOROBENZENE	19	0			
4	1,4-DICHLOROBENZENE	19	0			
5	2,4-DINITROTOLUENE	19	0			
6	2,6-DINITROTOLUENE	19	0			
7	2-CHLOROETHYL VINYL ETHER	3	0			
8	2-CHLORONAPHTHALENE	19	0			
9	2-METHYLNAPHTHALENE	19	0			
10	2-NITROANILINE	19	0			
11	3,3'-DICHLOROBENZIDINE	19	0			
12	3-NITROANILINE	19	0			
13	4-BROMOPHENYL PHENYL ETHER	19	0			
14	4-CHLOROANILINE	19	0			
15	4-CHLOROPHENYL PHENYL ETHER	19	0			
16	4-NITROANILINE	19	0			
17	ACENAPHTHENE	19	0			
18	ACENAPHTHYLENE	19	0			
19	ANTHRACENE	19	1	130	UG/KG	130 000
20	BENZO(a)ANTHRACENE	19	1	200	UG/KG	200 000
21	BENZO(a)PYRENE	18	1	190	UG/KG	190 000
22	BENZO(b)FLUORANTHENE	18	1	240	UG/KG	240 000
23	BENZO(ghi)PERYLENE	18	0			
24	BENZO(k)FLUORANTHENE	18	0			
25	BIS(2-CHLOROETHOXY)METHANE	19	0			
26	BIS(2-CHLOROETHYL)ETHER	19	0			
27	BIS(2-CHLOROISOPROPYL)ETHER	19	0			
28	BIS(2-ETHYLHEXYL)PHTHALATE	18	12	1300	UG/KG	336 583
29	BUTYL BENZYL PHTHALATE	19	0			
30	CHRYSENE	19	1	200	UG/KG	200 000
31	DI-n-BUTYL PHTHALATE	19	8	400	UG/KG	172 500
32	DI-n-OCTYL PHTHALATE	18	0			
33	DIBENZO(a,h)ANTHRACENE	18	0			
34	DIBENZOFURAN	19	0			
35	DIETHYL PHTHALATE	19	0			
36	DIMETHYL PHTHALATE	19	0			
37	FLUORANTHENE	19	2	580	UG/KG	315 000
38	FLUORENE	19	0			
39	HEXACHLOROBENZENE	19	0			
40	HEXACHLOROBUTADIENE	19	0			
41	HEXACHLOROCYCLOPENTADIENE	19	0			
42	HEXACHLOROETHANE	19	0			
43	INDENO(1,2,3-cd)PYRENE	18	0			
44	ISOPHORONE	19	0			
45	N-NITROSO-DI n-PROPYLAMINE	19	0			
46	N-NITROSODIPHENYLAMINE	19	3	370	UG/KG	260 000
47	NAPHTHALENE	19	0			
48	NITROBENZENE	19	0			
49	PHENANTHRENE	19	1	530	UG/KG	530 000
50	PYRENE	19	2	640	UG/KG	345 000
		926	33			

TABLE 27

OU2 SOIL PESTICIDE/PCB SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	226	0			
2	4,4'-DDE	226	0			
3	4,4' DDT	226	0			
4	ALDRIN	226	0			
5	AROCLOR-1016	226	0			
6	AROCLOR-1221	226	0			
7	AROCLOR-1232	226	0			
8	AROCLOR-1242	226	0			
9	AROCLOR 1248	226	0			
10	AROCLOR-1254	226	2	72	UG/KG	34 6667
11	AROCLOR 1260	226	0			
12	CHLORDANE	226	0			
13	DIELDRIN	226	0			
14	ENDOSULFAN I	226	0			
15	ENDOSULFAN II	226	0			
16	ENDOSULFAN SULFATE	226	0			
17	ENDRIN	226	0			
18	ENDRIN KETONE	226	0			
19	HEPTACHLOR	226	0			
20	HEPTACHLOR EPOXIDE	226	0			
21	METHOXYCHLOR	226	0			
22	TOXAPHENE	226	0			
23	alpha-BHC	226	0			
24	beta-BHC	226	0			
25	delta-BHC	226	0			
26	gamma-BHC (LINDANE)	226	0			
		5876	2			

TABLE 28

OU2 SEDIMENT PESTICIDE/PCB SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	23	0			
2	4,4'-DDE	23	0			
3	4,4'-DDT	23	1	95	UG/KG	95
4	ALDRIN	23	0			
5	AROCLOR-1016	23	0			
6	AROCLOR 1221	23	0			
7	AROCLOR-1232	23	0			
8	AROCLOR-1242	23	0			
9	AROCLOR-1248	23	0			
10	AROCLOR-1254	23	1	540	UG/KG	540
11	AROCLOR-1260	23	0			
12	CHLORDANE	3	0			
13	DIELDRIN	23	0			
14	ENDOSULFAN I	23	0			
15	ENDOSULFAN II	23	0			
16	ENDOSULFAN SULFATE	23	0			
17	ENDRIN	23	0			
18	ENDRIN KETONE	23	0			
19	HEPTACHLOR	23	0			
20	HEPTACHLOR EPOXIDE	23	0			
21	HEXAVALENT CHROMIUM	3	0			
22	METHOXYCHLOR	23	0			
23	TOXAPHENE	23	0			
24	alpha-BHC	23	0			
25	alpha CHLORDANE	20	0			
26	beta-BHC	23	0			
27	delta-BHC	23	0			
28	gamma BHC (LINDANE)	23	0			
29	gamma-CHLORDANE	20	0			
		621	2			

TABLE 29

SITE-SPECIFIC CHEMICAL ANALYSIS ROSTER

MATRIX	ANALYTICAL SUITES			
	Volatile Organics	Acid Extractables	Base/Neutral Extractables	Pesticides/ PCBs
Waste Sources	Yes [5]	Yes [2]	Yes [2]	Yes [2]
Soils/Sediments	Yes [5]	Yes [3]	Yes [3]	No [2]
Ground Water	Yes [5]	No [4]	No [4]	No [2]
Surface Water	Yes [5]	No [4]	No [4]	No [2]

Notes

Case Determination

[1] Case I

[2] Case II, supplemental data required only for IHSSs that were not previously investigated (see Table 24)

[3] Case II, supplemental data required only for SED011 and SED012

[4] Case II, supplemental data not required

[5] Case III, supplement data required

TABLE 30

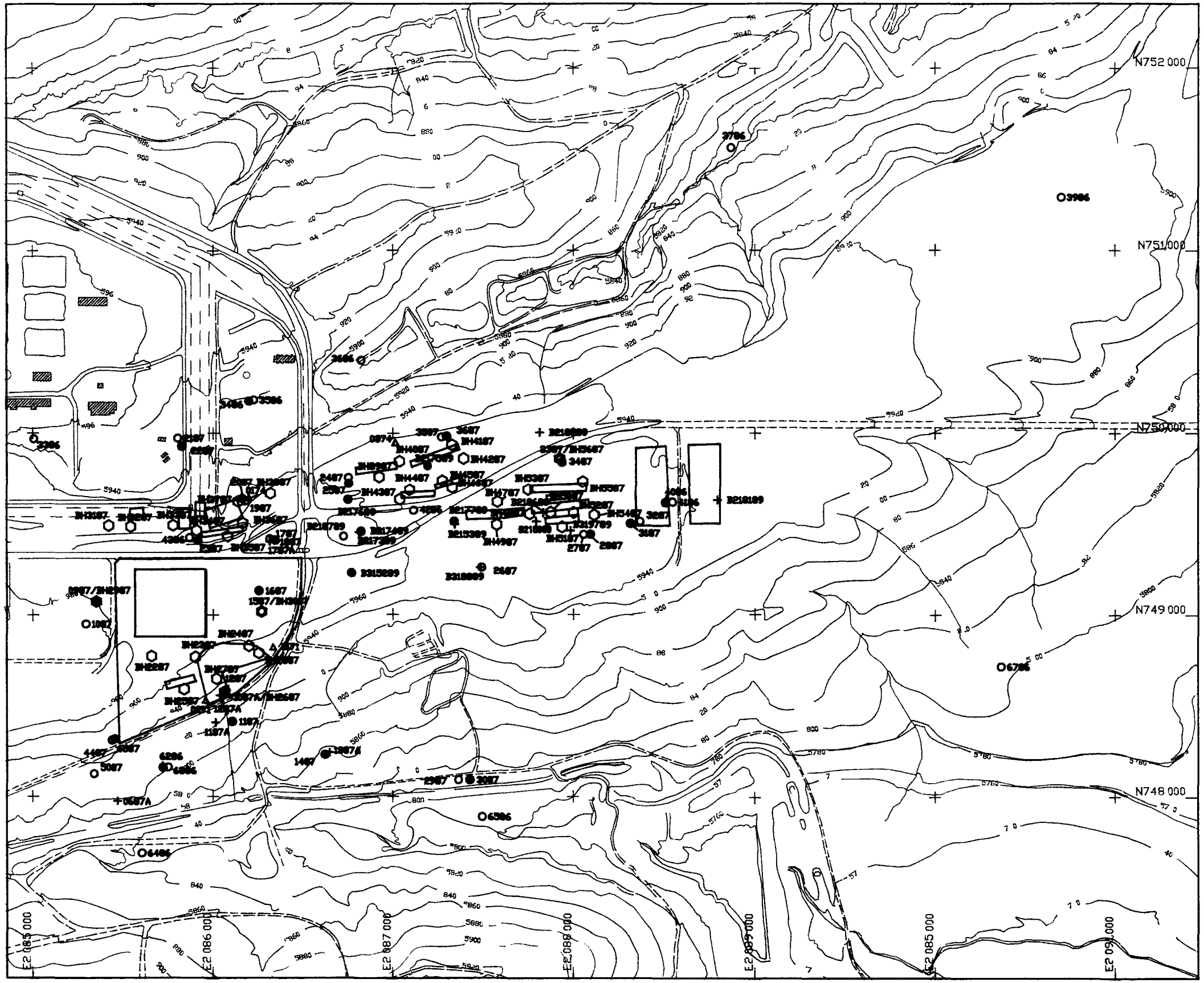
GROUND-WATER VOLATILE ORGANIC ANALYSIS METHOD SPECIFICATION

CLP Method	EPA Method 502.2
3386	All 1991 Wells
4186	
4286	3986
4286	5087
4386	6386
1087	6786
1587	2987
1787	4487
1987	3686
2487	3786
2687	6486
2787	6586
3287	6686
3387	0386
3587	0286
2187	6286
0171	3087BR
0271	4587BR
0174	
0374	
0987BR	
1187BR	
1287BR	
1487BR	
2387BR	
2587BR	
3687BR	
3486	
4086	
1687BR	
18887BR	
2087BR	
2287BR	
2887BR	
3187BR	
3487BR	

REFERENCES

EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA OSWER Directive 9355 3-01

EPA, 1989, Data Quality Objectives for Remedial Response Activities OSWER Directive 9355 0-7B



EXPLANATION

- INDIVIDUAL HAZARDOUS SUBSTANCE SITE AND IHSS DESIGNATION
- B217489 ● BEDROCK MONITOR WELL
- B213789 ○ ALLUVIAL MONITOR WELL
- 0392 △ PRE-1986 MONITOR WELL
- B217389 + ABANDONED HOLE
- BH4987 ⬡ BOREHOLE

Scale 1 = 600

0' 300' 600'

CONTOUR INTERVAL = 20'

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant Golden Colorado

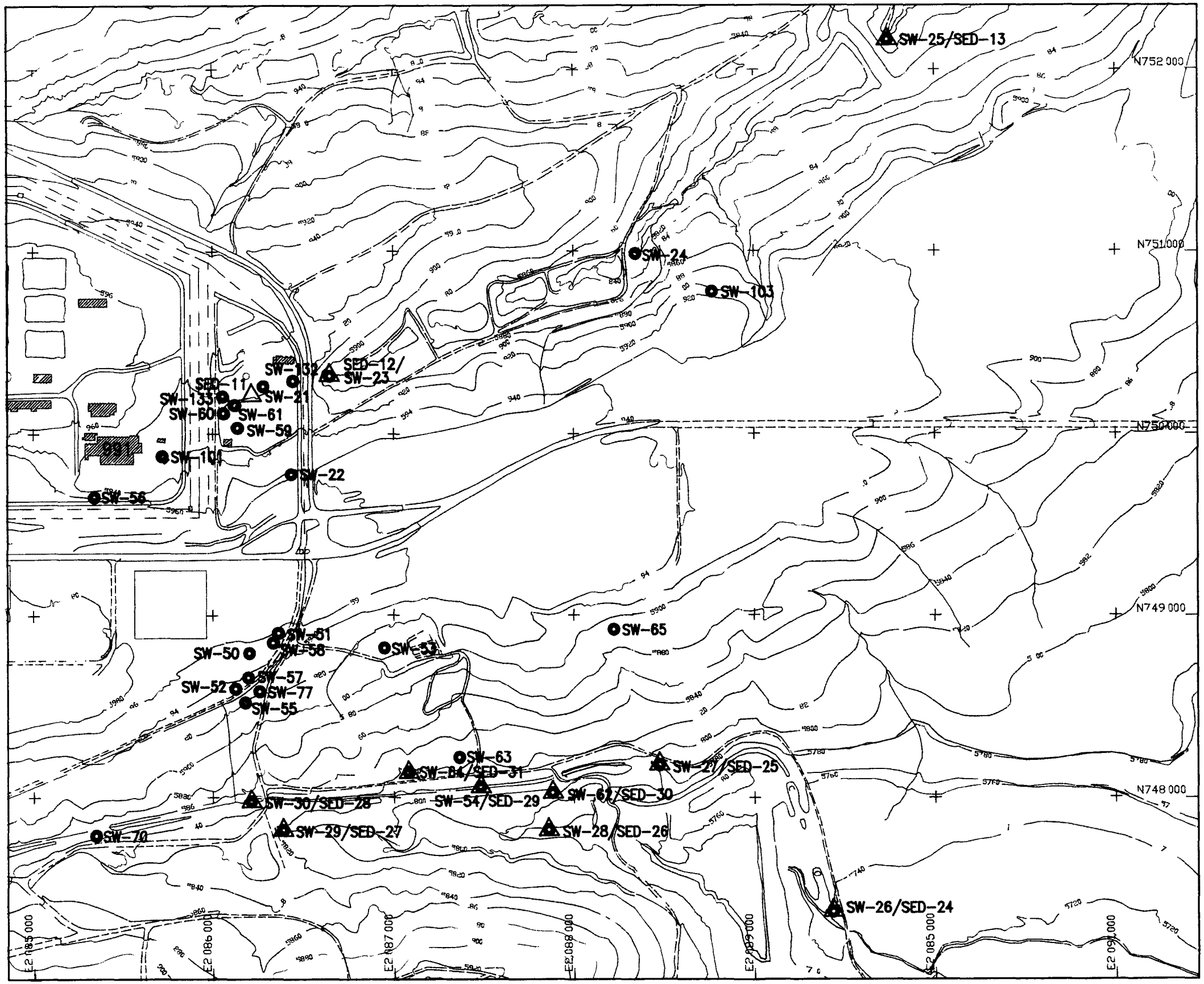
OPERABLE UNIT NO 2
PHASE II RFI/RI WORK PLAN (ALLUVIAL)

PHASE I REMEDIAL INVESTIGATION MONITOR WELL AND BOREHOLE LOCATIONS

FIGURE 1

July, 1991

833W021/MS070291/600



R33N020.M6070291/600

EXPLANATION

SW-25 — SURFACE WATER MONITORING STATION

SED-11 — SEDIMENT SAMPLING STATION

ANALYZE FOR VOLATILES ONLY (CLP METHOD)

ANALYZE FOR ALL TCL ORGANICS

ANALYZE FOR VOLATILES ONLY (METHOD-EPA 502.2)

N

Scale 1 = 600

0' 300' 600'

CONTOUR INTERVAL = 20'

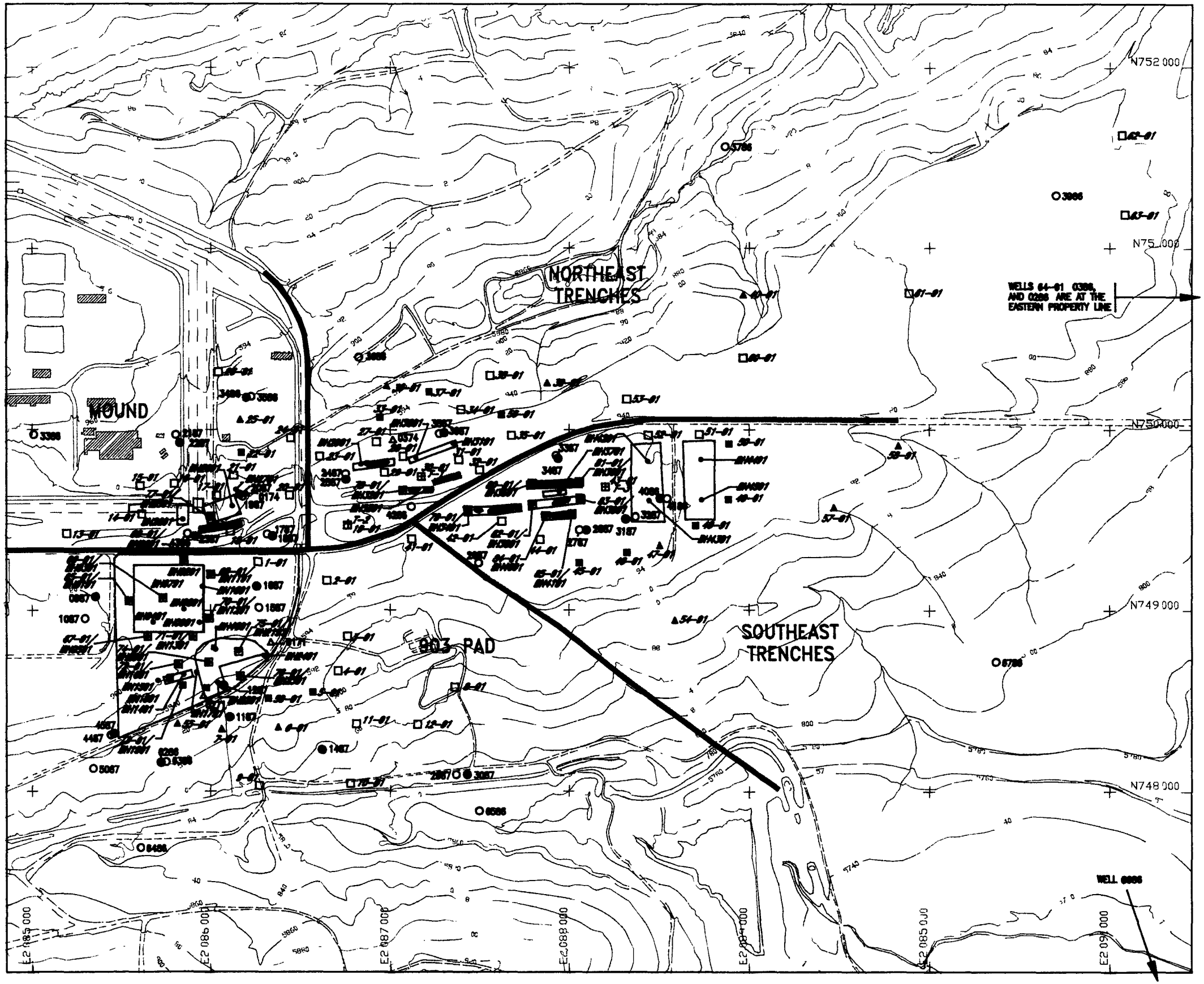
U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant Golden, Colorado

OPERABLE UNIT NO 2
PHASE II RFI/RI WORK PLAN (ALLUVIAL)

SURFACE WATER AND SEDIMENT MONITORING STATIONS

FIGURE 2

July, 1991



EXPLANATION

- BEDROCK MONITOR WELL
- ALLUVIAL MONITOR WELL
- PROPOSED SOURCE CHARACTERIZATION ALLUVIAL MONITOR WELL AND BOREHOLE
- PROPOSED PLUME CHARACTERIZATION ALLUVIAL MONITOR WELL
- PROPOSED SOURCE CHARACTERIZATION BOREHOLE
- DRIVER WELL SITE – PROPOSED PLUME CHARACTERIZATION ALLUVIAL MONITOR WELL SITE
- CONTINGENCY WELL SITE – PROPOSED PLUME CHARACTERIZATION ALLUVIAL MONITOR WELL SITE
- PROPOSED HYDRAULIC TEST LOCATION
- INDIVIDUAL HAZARDOUS SUBSTANCE SITE LOCATION
- LOCATION OF BARRELS DETERMINED BY VISUAL INSPECTION OR MAGNETOMETER SURVEY

TOTAL PROPOSED WELL SITES	85
TOTAL BOREHOLES	46
TOTAL DRILL SITES	131

- ANALYZE FOR VOLATILES ONLY (CLP METHOD)
- ANALYZE FOR ALL TCL ORGANICS
- ANALYZE FOR VOLATILES ONLY (METHOD–EPA 502.2)

N

Scale 1 = 600

0' 300' 600'

CONTOUR INTERVAL = 20'

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OPERABLE UNIT NO 2
PHASE II RFI/RI WORK PLAN (ALLUVIAL)

EXISTING AND PROPOSED PHASE II RFI/RI MONITOR WELL AND BOREHOLE LOCATIONS

FIGURE 3

July 1991

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